



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/764,810	01/16/2001	Abraham Mendelson	42390P10140	7766

8791 7590 06/07/2005

BLAKELY SOKOLOFF TAYLOR & ZAFMAN  
12400 WILSHIRE BOULEVARD  
SEVENTH FLOOR  
LOS ANGELES, CA 90025-1030

EXAMINER

KIM, HONG CHONG

ART UNIT

PAPER NUMBER

2186

DATE MAILED: 06/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/764,810

Applicant(s)

MENDELSON ET AL.

Examiner

Hong C. Kim

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-16, 20-25 and 30 is/are rejected.
- 7) ☒ Claim(s) 7-9, 17-19 and 27-29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**Detailed Action**

1. Claims 1-30 are presented for examination. This office action is in response to the RCE filed on 5/13/05.

2. Applicants are reminded of the duty to disclose information under 37 CFR 1.56.

***Claim Objections***

3. Claim 28 is objected to because of the following informalities: It appears that "claim 24" should be changed to – claim 26—for consistency. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6, 10, 11-16, 20, 21-26 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over "The cache Memory Book" , Jim Handy, Academic Press, 1993, pp 37-93 (Handy) in view of Arlitt et al. (Arlitt) US Paten No. 6,272,598.

As to claims 1, 11, and 21, Handy discloses an apparatus comprising: a cache manager (Fig. 2.10 control logic) to manage a transfer (page 63 eviction and page 55, replace algorithm read on this limitation) of a trace (Page 60 instruction cache read on

this limitation); an execution unit (Fig. 2.10 CPU); a first cache (Fig. 2.23 L1 and Section 2.2.10) coupled to the cache manger to evict the trace based on a replacement mechanism (page 63 eviction and page 55, replace algorithm read on this limitation and since during a cache miss, a line is needed to evict to free up a space for a new entry); and a second cache (Section 2.2.10 L3 cache) coupled to the cache manager to receive the evicted trace based on a replacement algorithm (page 63 eviction and page 55, replace algorithm read on this limitation and since during a cache miss in L2, a line is needed to evict to L3 to free up a space for a new entry in L2) however, Handy does not specifically disclose the second cache coupled to the cache manager to receive the evicted trace based on a first number of access to the trace.

Arlitt discloses a cache to receive the evicted trace based on a first number of access to the trace (col. 6 lines 43-55) for the purpose of increasing the hit rate thereby increasing the system speed by retaining popular lines for longer time periods (col. 6 lines 52-55).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace LRU algorithm in L2 with LFU/MFU algorithm thereby the cache coupled to the cache manager to receive the evicted trace based on a first number of access to the trace as taught by Arlitt into the invention of Handy for the advantages stated above.

As to claims 2, 12, and 22, Arlitt further discloses a usage counter (col. 6 line 45 and LFU/MFU replacement policy reads on this limitation).

As to claims 3, 13, and 23, Arlitt further discloses a comparator and a first threshold value that being a fixed number or a first dynamically adjusted number (col. 6 lines 49, frequency count exceeds a threshold parameter reads on this limitation).

As to claims 4, 14, and 24, Handy further discloses the trace is transferred from the first cache to the second cache (Fig. 2.23 and Section 2.2.10). Arlitt further discloses the trace is transferred when the first threshold value is less than the first number of accesses to the trace (col. 6 lines 43-55).

As to claims 5, 15, and 25, Arlitt further discloses the trace is discarded when the first threshold value is more than the first number of accesses to the trace (replacement or eviction reads on this limitation since a line is evicted to the L2 col. 6 lines 43-55).

As to claims 6, 16, and 26, Handy further discloses a L2 cache (Section 2.2.10).

As to claims 10, 20, and 30, Handy further discloses a LRU mechanism (col. 2 lines 26-27).

#### ***Allowable Subject Matter***

5. Claims 7-9, 17-19, and 27-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all

of the limitations of the base claim and any intervening claims and if rewritten or amended to overcome the claim objection(s) or claim rejection(s), set forth in this Office action.

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See attached PTO-892.

2. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) days from the mail date of this letter. Failure to respond within the period for response will result in **ABANDONMENT** of the application (see 35 USC 133, MPEP 710.02, 710.02(b)).

3. When responding to the office action, Applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. ' 1.111(c).

4. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist examiner to locate the appropriate paragraphs.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hong Kim whose telephone number is (571) 272-4181. The examiner can normally be reached on M-F 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 whose telephone number is (571) 272-2100.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

7. **Any response to this action should be mailed to:**

Application/Control Number: 09/764,810

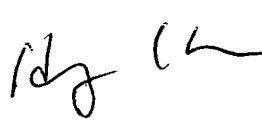
Page 7

Art Unit: 2186

Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**or faxed to TC-2100:**  
(703) 872-9306

Hand-delivered responses should be brought to the Customer Service Window (Randolph Building, 401 Dulany Street, Alexandria, VA 22314).

  
H Kim  
Primary Patent Examiner  
June 4, 2005